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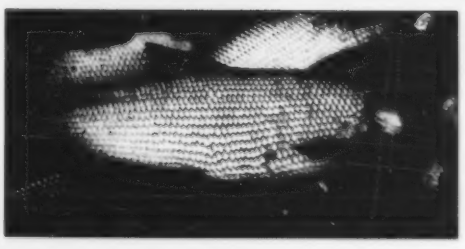
Proposed Goals, Policies and Strategies for Fisheries Management in Saskatchewan in the 1990's



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PROPOSED GOALS, POLICIES AND STRATEGIES FOR FISHERIES MANAGEMENT IN SASKATCHEWAN IN THE 1990s

by

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and

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FORWARD

This document is one of a continuing series of discussion papers which examine the issues confronting the availability and use of fish resources in Saskatchewan and which seek public input in the development of appropriate management goals and strategies to meet these issues. Previous papers were directed to management goals for the 1980s as well as to management of specific fisheries in the province. This document deals with goals and strategies for fisheries management up to the 21st century.

It is important that the public understand the basic precepts from which the proposals arise. These were expressed a decade ago in a strategic plan for the 1980s and they are just as valid today. They are:

1. to encourage the wise use of fish within the limits of sustainable yields for the benefit of Saskatchewan citizens;

2. to maintain productive populations of native fish species in natural habitats;

3. to encourage conservation of fish habitat and maintain a broad diversity of fishing opportunity;

4. to equitably allocate harvests of the resource among the potential users; and,

5. to encourage the involvement of Saskatchewan residents in fisheries conservation, management and allocation decision-making processes.

This document has two principal objectives. The first is to describe a framework of goals and strategies which should reconcile demand for Saskatchewan fish with the sustainable supply. This is often known as

"fisheries management". The second is to facilitate the active involvement of Saskatchewan citizens in the decision-making processes associated with fisheries management.

The material in this document is for public review. Comments are invited. Management of the fish resource of Saskatchewan is a complex task and the assistance of the public is both needed and appreciated. Please direct your comments to:

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TABLE OF CONTENTS

PAGE

INTRODUCTION..... 1

DEFINITIONS..... 2

CURRENT SITUATION..... 3

Aquatic Resources of Saskatchewan..... 3

Fisheries of Saskatchewan..... 6

Legal Jurisdictions..... 7

ACHIEVEMENTS SINCE THE STRATEGIC PLAN FOR THE 1980s..... 8

Evaluation of achievements..... 12

ISSUES..... 14

Conflict among the stakeholders..... 14

Loss of fish and fish habitat..... 17

Poor economic performance of the fisheries..... 19

A PROPOSED PLAN FOR SASKATCHEWAN'S FISHERIES IN THE 1990s..... 20

Goals..... 20

Policies..... 20

Fisheries Management Principles..... 23

Strategies and Tactics..... 26

Conserve, enhance and rehabilitate fish populations and restore their habitats..... 26

Implement co-management with the stakeholders and allocate harvests optimally..... 31

Rationalize the fisheries..... 36

IMPLEMENTATION..... 39

Program Actions..... 40

Southern Management Zone..... 40

Central Management Zone..... 41

Northern Management Zone..... 43

Entire Province..... 44

CONCLUSION..... 45

SUGGESTED READING..... 46

TABLE OF CONTENTS CONTINUED

PAGE

APPENDICES

A. Fish, common property resources and the tragedy of the commons..... 48

B. Sustainable development..... 51

C. Co-management..... 54

LIST OF FIGURES

FIGURE TITLE PAGE

1. Economically important fish, aquatic invertebrates and fisheries of Saskatchewan..... 5

2. Issues affecting Saskatchewan's fisheries for the 1990s..... 15

3. Proposed goals, issues and strategies for Saskatchewan's fisheries for the 1990s..... 21

4. Proposed strategies and tactics for Saskatchewan's fisheries for the 1990s..... 27

LIST OF TABLES

TABLE TITLE PAGE

1. Estimated harvests of fish, Saskatchewan, 1986-86..... 5

INTRODUCTION

A strategic plan looks at the past, the present and into the future. It is essential for planning and is comparable to navigating a ship. The navigator must know where he is, where he has come from and where he wants to go. Thus a strategic plan examines the issues and assesses progress made and problems encountered in resolving them. It sets new goals and defines the policies needed to deal with the issues. A strategic plan enables an organization to adjust its priorities and marshall its resources so that it can move to the position desired. As in navigation, the plan requires periodic evaluation and course corrections, or adjustments. The strategic plan for the 1990s does this by looking at the current situation regarding Saskatchewan's fisheries, evaluating progress made in the 1980s, and charting a course for the future.

The strategic plan for the 1980s had its genesis in a report entitled, **"Proposed goals and strategies for fisheries management in the 1980s"**. This document, which identified the principal fisheries management issues and species problems, and described strategies for dealing with them, was released to the public for review and comment in January 1981.

Following this review, the **"Saskatchewan Fisheries Policy - Action Plan"** was prepared, approved by Cabinet in 1983, and became the strategic plan for the 1980s. Two key issues were recognized, supply-demand imbalance and allocation, which required urgent attention and resolution. Strategies for addressing these included fish enhancement programs to increase fish stocks, new fisheries management zones and reduced angling limits and commercial species quotas to balance increasing fishing pressure with availability of fish, and an allocation process to reconcile supply and demand for fish.

Almost a decade has passed since the plan was first conceived and it is time for an evaluation. The fish resources of Saskatchewan are a priceless legacy, but the situation with respect to the fisheries, and the fish

resources on which they depend, is critical. They are an important contributor to the recreation, tourism and renewable resource sectors of the provincial economy, but the current and projected utilization of species in demand, such as walleye, lake trout and pike, cannot be supported by the available supply everywhere. Walleye and lake trout stocks in lakes of the Churchill and Mackenzie River drainage basins, respectively, are being overharvested and are a matter of special concern. This overharvesting continues despite increased conservation and management activities in recent years. The strategic plan for the 1990s describes a new, comprehensive and fundamentally different approach which will resolve these issues and ultimately make harvests commensurate with sustainable supplies.

DEFINITIONS

This paper uses some terms in specific and precise ways. The following definitions apply:

ALLOCATION: A process for sharing the available fish harvests on individual lakes which has two steps: determining the amount of resource available; and determining who gets what portion. The first step is biological and is based on supplies of fish present. The second step may be achieved by stakeholders reconciling differing values and uses through consensus and determining which of them are best.

FISHERMAN: A male or female person who fishes.

GOAL: A statement of general purpose addressed by broad courses of action or strategies. Goals are long-term in outlook, may not be attainable and cannot be evaluated.

ISSUE: An unfulfilled public need or problem which is, or may become, a government responsibility.

OBJECTIVE: A precise statement of purpose directed to a concrete administrative endpoint. Objectives are specific, attainable, measurable and amenable to evaluation.

POLICY: A course of action resulting from a re-statement or interpretation of an issue to render it amenable to administrative action consistent with prevailing political opinion.

STAKEHOLDER: A person with a concern for, or dependence on the fish resource.

STRATEGY: A plan or course of action directed to accomplishing a particular goal, addressing a particular strategy or reconciling a goal with an issue. Strategies are broad in scope and have long time horizons.

TACTIC: A procedure for achieving an objective. Tactics are narrow in scope, have short time horizons, seek objective answers to problems, and concentrate on feasibility and consistency.

CURRENT SITUATION

AQUATIC RESOURCES OF SASKATCHEWAN

The fish resources of Saskatchewan are found in its lakes, streams and reservoirs. There are more than 94,000 lakes with a total surface area in excess of 66,000 square kilometers, representing about 10% of the province's surface area. In addition, there are an estimated 1,000 square kilometers of streams within the province. Most lakes are small, averaging 71 hectares. The larger lakes, although few in number, contain more than half the surface water area. Most of the lakes - 89% of the number and 73% of the area - occur on the Precambrian Shield.

Although the number of lakes is large, it is not infinite, and there is a limit to the amount of fish that can be produced. Shield lakes, which include those of the Mackenzie River drainage basin, are not as productive as sedimentary lakes because they contain low concentrations of minerals which act as nutrients for organisms living in them.

There is a marked difference in the distribution of lakes and streams and the people who use them. More than 97% of the people live in the southern half of the province and more than 90% of the lakes and streams occur in the northern half. As a result there are major differences in the approaches to fisheries management in the two portions of the province.

About 50,000 lakes in Saskatchewan contain fish; the rest are too small, shallow, acidic or saline for them. About 5,000 of the larger lakes are fished; the remainder are too small to sustain fisheries. This means that almost every lake in Saskatchewan capable of supporting a fishery does so. Most have at least two fisheries and many are fully allocated.

Sixty-eight species of fish occur in Saskatchewan. Of these, 21 are economically important (Figure 1), are harvested by one or more groups of fishermen, and receive management attention. Several species of game trouts have been introduced to provide variety and divert angling pressure from heavily fished native species.

The total harvest for 1985-86 was 9.7 million kg, of which 43% was taken by anglers, 38% by commercial net fishermen and the balance by subsistence fishermen (Table 1). Seventy-two percent of the harvest was native game fish, of which more than half was taken by anglers. Harvests of walleye in the Central and Northern Management Zones, lake trout in the Northern Zone, and pike and whitefish in the Southern Zone, were excessive.

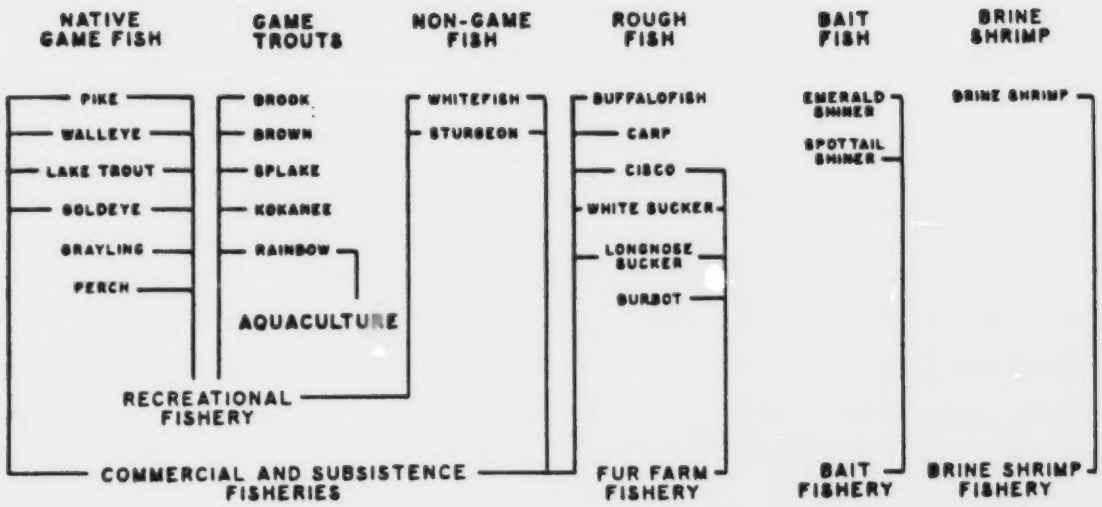

Figure 1. Economically important fish, aquatic invertebrates and fisheries of Saskatchewan.

Table 1. Estimated harvests of fish, Saskatchewan, 1985-86.

Estimated Harvests 1985-86	Native Game Fish	Game Trouts	Non Game Fish	Total
		millions of kilograms		
Commercial	1.8	...	1.9	3.7
Subsistence	1.2	...	0.6	1.8
Recreational	4.0	0.1	0.1	4.2
Total	7.0	0.1	2.6	9.7

FISHERIES OF SASKATCHEWAN

There are eight different fisheries in Saskatchewan: four principal (subsistence, commercial net, recreational and outfitting; the latter is included within the recreational fishery in Figure 1); and four minor (fur farm, bait, brine shrimp and aquaculture).

The **subsistence fishery** includes those who fish with gill nets to obtain food for themselves, their families and their dogs. Most subsistence fishermen are native and more than half are status or Treaty Indians. In 1985, 4,048 subsistence fishermen harvested 1.8 million kg of fish in Saskatchewan (Table 1).

The **commercial net fishery** includes those who fish with gill nets and sell their catches. In 1984-85, the industry employed an estimated 2,100 people, of which 1,100 were licenced fishermen, 1,000 were helpers and 100 were employed in collecting, handling and processing the catch. More than 97% of the commercial fishermen in the northern half of the province are native; commercial fishing contributes over half their earned income, with one-third of them earning 90% of their income from commercial fishing. In 1984-85, Saskatchewan commercial net fishermen harvested 3.7 million kg of fish, half of which was game fish (Table 1).

The **recreational fishery** comprises the largest group of fishermen. In 1985, there were about 250,000 anglers in Saskatchewan, including 140,000 licensed residents, 20,000 resident senior citizens, 20,000 non-residents and 70,000 children, and they caught 4.2 million kg of game fish (Table 1).

The **commercial outfitting fishery** includes those who provide fishing services for anglers. In 1981, there were 180 outfitters located in northern Saskatchewan. Their establishments contained a total of 5,499 beds, they used 40% of this capacity and served 84,931 guests.

The fur farm fishery was a major user of the fish resource in Saskatchewan during the 1950s and 1960s when prices for mink pelts were high. Fur prices declined in the 1960s and the numbers of fur farm fishermen decreased rapidly. About six farms are currently in Saskatchewan.

The commercial baitfish fishery harvested 7,000 kg of baitfish in 1987. Fifty-seven commercial baitfish fishermen participated in the fishery.

The saline lakes of south and central Saskatchewan provide the resource for the brine shrimp industry. Harvested primarily by one major processor, the industry produced approximately 45,000 kg of brine shrimp in 1987. The product is sold as tropical fish food.

Aquaculture, or the farming of fish, has been practised in Saskatchewan since the late 1960s. Currently about 2,200 people are involved each year, most of whom raise rainbow trout for themselves, their families and friends. Until 1985, only extensive aquaculture was practised. This involves stocking trout in potholes and dugouts each spring, allowing them to roam freely eating natural foods and harvesting them in the autumn or early winter. Intensive aquaculture, where are trout raised in closed environments such as hatcheries and cages, began in 1985.

LEGAL JURISDICTIONS

The responsibility for fish conservation in Saskatchewan lies with Canada. Saskatchewan manages fish in its provincial waters under an agreement with Canada. This means that Saskatchewan has been delegated responsibility for licencing commercial and recreational fishing, allocating harvests and enforcing regulations enacted under the federal ***Fisheries Act*** whereas the federal government legislates fishing seasons, quotas, size limits and the type of gear that must be used. Although Saskatchewan administers federal laws it provides the funds needed to administer and enforce them.

Fish in Saskatchewan waters belong to the province because it owns the land beneath these waters. As a result Saskatchewan controls access by determining who can fish provincial waters, the privileges that may be conferred and the fees that must be paid.

Canada Fisheries and Oceans administers all sections of the federal ***Fisheries Act*** except the section pertaining to pollution of fish habitat, which is administered by Environment Canada. This agency is concerned with the broader issues of environmental protection and its approach to regulation differs from that of Canada Fisheries and Oceans which hampers the effectiveness of the Act. In addition, Saskatchewan has been delegated very limited authority to administer the habitat provisions of the Act which further hampers its effectiveness.

ACHIEVEMENTS SINCE THE STRATEGIC PLAN FOR THE 1980s

Considerable progress has been achieved in a number of diverse areas considered by the "Action Plan". These achievements are substantive. They not only made an important contribution to managing Saskatchewan's fisheries in the 1980s, but they prepared the way for the type of management required in the 1990s.

HATCHERY IMPROVEMENTS, 1982

- Major renovations, initiated in 1982 and continued in stages throughout the 1980s, resulted in improved ability to produce walleye fry and salmonid fingerlings.

- Quality of salmonid fingerlings was also enhanced which improved stocking success and returns to anglers.

REGIONAL APPROACH TO FISHERIES MANAGEMENT, 1983

- A decentralized approach was adopted with the establishment of regional

offices in La Ronge, Meadow Lake, Prince Albert, Saskatoon, Swift Current, Melville and Regina.

- This has led to improved delivery of programs, better contact with clients and stakeholders and improved knowledge about the resources.

NEW FISHERIES RESEARCH IMPERATIVES, 1983

- The nature of research work carried out at the Saskatchewan Fisheries Laboratory has changed from that which was principally devoted to acquiring information on Saskatchewan lakes and stocks of fish to that which is primarily directed to applied research.

MINIMAL CONSUMPTION ANGLING, 1983

- Promotion of catch and release, and barbless hooks, began in the Angler's Guides for 1983 and 1984, respectively.

- This formed the initial phase of a low-key program promoting low/no consumption angling.

- A program promoting fishing quality in more than 30 northern remote lakes, known as **"High Quality Angling"** waters, was initiated in May 1989. The program features reduced daily limits and was developed in co-operation with the Saskatchewan Outfitters Association.

FISH ENHANCEMENT FUND, 1984

- The Fish and Wildlife Development Fund (FWDF) was established in 1984 to develop new fishing opportunities through projects such as rearing ponds, lake aeration, development of trout waters, habitat improvement and lake rehabilitation.

- These initiatives, which are over and above those provided by current fisheries managment activities, are funded by the sale of angling licences.

- Since FWDF was established, more than $2.4 million have been spent on approximately 60 fish enhancement projects, of which 30 are co-operative ventures with local conservation groups and other agencies.

SPORT FISH CONSERVATION PROGRAM, 1985

- Management options for the recreational fishery were circulated for public discussion in April 1984, and the program was introduced in May 1985.

- The program included revisions to the fisheries management zones, new fishing season opening and closing dates, and adjusted limits for some species.

- Changes were made to protect the recreational fishery where it is most vulnerable while continuing to provide the widest possible range of recreational and economic benefits to the resource.

- A survey of sport fishing in 1985 indicated the program was effective in reducing harvests.

FISH MARKETING IN SASKATCHEWAN, 1985

- Special regulations were introduced in December 1985 to expand markets for commercial fish caught in Saskatchewan.

- They resulted in increased revenues to fishermen and increased availability of fish to Saskatchewan consumers.

- They also helped fishermen make sound business development decisions, resulted in the investment of more than $300,000 and created 15-20 jobs.

COMMERCIAL USERS CONSERVATION PLAN, 1986

- Management options for the commercial users of the fish resource (i.e.,

commercial net fishermen and commercial outfitters) were circulated for comment and discussion in October 1985.

- Portions of the plan were implemented in 1986 and subsequently.

- The program addressed species quotas, seasons and enforcement for net fishermen and lodge capacity guidelines for outfitters.

- Quotas for individual species have been developed and implemented at a number of lakes as a means of dealing with species in high demand.

AQUACULTURE POLICY, 1989

- A comprehensive aquaculture policy was implemented in 1988 to accommodate the needs of a growing aquaculture industry.

- The policy allows for a wide range of aquaculture activities, including cage aquaculture and culture of non-salmonids, while providing safeguards to protect the environment, wild fish stocks and other resource users.

- As a result of the policy, a 20,000-30,000 kg/year cage aquaculture industry has developed, and three non-salmonid species (i.e., tilapia, Australian crayfish and walleye) are being experimentally cultured to determine their aquaculture potential.

FREE FISHING DAY, 1989

- This was instituted July 8, 1989, to recognize sport fishing as a valuable recreational activity and to highlight the many enhanced fishing waters in Saskatchewan.

- Several special events, many of which were sponsored by the Saskatchewan Wildlife Federation, were held in recognition of this day.

FISHING INDUSTRY STUDIES, 1981-85

- The industries and selected fisheries were studied by the province together with Canada Fisheries and Oceans.

- These studies provided new perspectives on harvests and issues.

- Results indicated a complex array of problems, many of which resulted from the province treating its fish resources as common property.

- This situation cannot be improved by simply providing additional financial assistance as recommended by the "Action Plan".

FISHERIES ALLOCATION, 1989

- Although considerable progress has been achieved in working with stakeholders to allocate selected lakes and fisheries since the mid 1970s, little progress has been made overall because the "Action Plan" did not address problems created by the fish resource being treated as common property.

- A background report on fisheries allocation was prepared in March 1989.

EVALUATION OF ACHIEVEMENTS

Three significant factors emerge from an evaluation of achievements of the 1980s. First, successes were achieved with the management of supply but not with the management of demand. Supplies of fish in many lakes appear to have become stabilized but, overall, demand is still increasing and must be reconciled with supplies of fish.

The province supports an active fish stocking program aimed primarily at establishing and maintaining stocks of game fish in about 140 lakes and streams. Although the program is successful it is not a cure-all for all populations with too few fish. It is certainly not suitable for replacing

stocks of wild fish in large lakes because of the numbers of fish, hatchery, human and financial resources required. Proper conservation and management is essential for wild populations because they must support both their reproductive requirements and their fisheries. Because there are limitations on the amount of fish that can be supplied, more attention must be given to managing demand.

Second, the relationship between allocation and the supply-demand imbalance has become increasingly clear. Work in other jurisdictions has shown that control of demand for fish can result from an ecologically sound, and economically and socially rational stake-holder-driven allocation process. These components are inseparable: successful management of demand must involve stakeholders in the allocation of scarce resources.

Third, the nature of fisheries management has changed significantly during the 1980s. Prior to this, supplies of fish generally exceeded demand, and biology was the main consideration of management. In the 1980s, economic, social, legal and environmental factors became integral components of daily decisions. Not only are the number and complexity of factors increasing but the time required to make decisions, which must be responsive to local situations, is decreasing and has become critical.

The challenge is to continue to deliver sound programs, built on the strengths developed in the 1980s, which confront and resolve the major issues while remaining within the constraints of reduced staff and restricted budgets.

ISSUES

Although the situation facing Saskachewan's fisheries is serious, it is not without solutions. These solutions, which are in the form of strategies and tactics, must address the major problems and issues. Three principal issues must be resolved: conflict among the stakeholders of the resource; loss of fish and fish habitat; and poor economic performance of the fisheries. These issues, shown in Figures 2 and 3, are interrelated and complex.

CONFLICT AMONG THE STAKEHOLDERS

The principal conflicts are between commercial and recreational fishermen, and between traditional resource users and other fishermen. Conflicts have also developed within groups as outfitters - and commercial fishermen - compete with each other for the same lakes and fish. These are aggravated because of differing values, claims and rights as well as the unequal distribution of people and fish resources in Saskatchewan. In addition, they have social, cultural, recreational and economic components, which add to their complexity. Most too have an emotional aspect which makes them particularly difficult to deal with.

CAUSES

- Flawed allocation of harvests among the different user groups has occurred as a result of the virtually unrestricted access to the resources and by the public's perception that fish resources shall be free to everyone (Figure 2).

    - Flawed allocation is:
        - **inequitable:** all stakeholders are not treated alike;
        - **inefficient:** fish populations and earnings have been lost;
        - **insensitive:** local values and needs are not always considered; and,
        - **not comprehensive:** fish harvests have been allocated in a

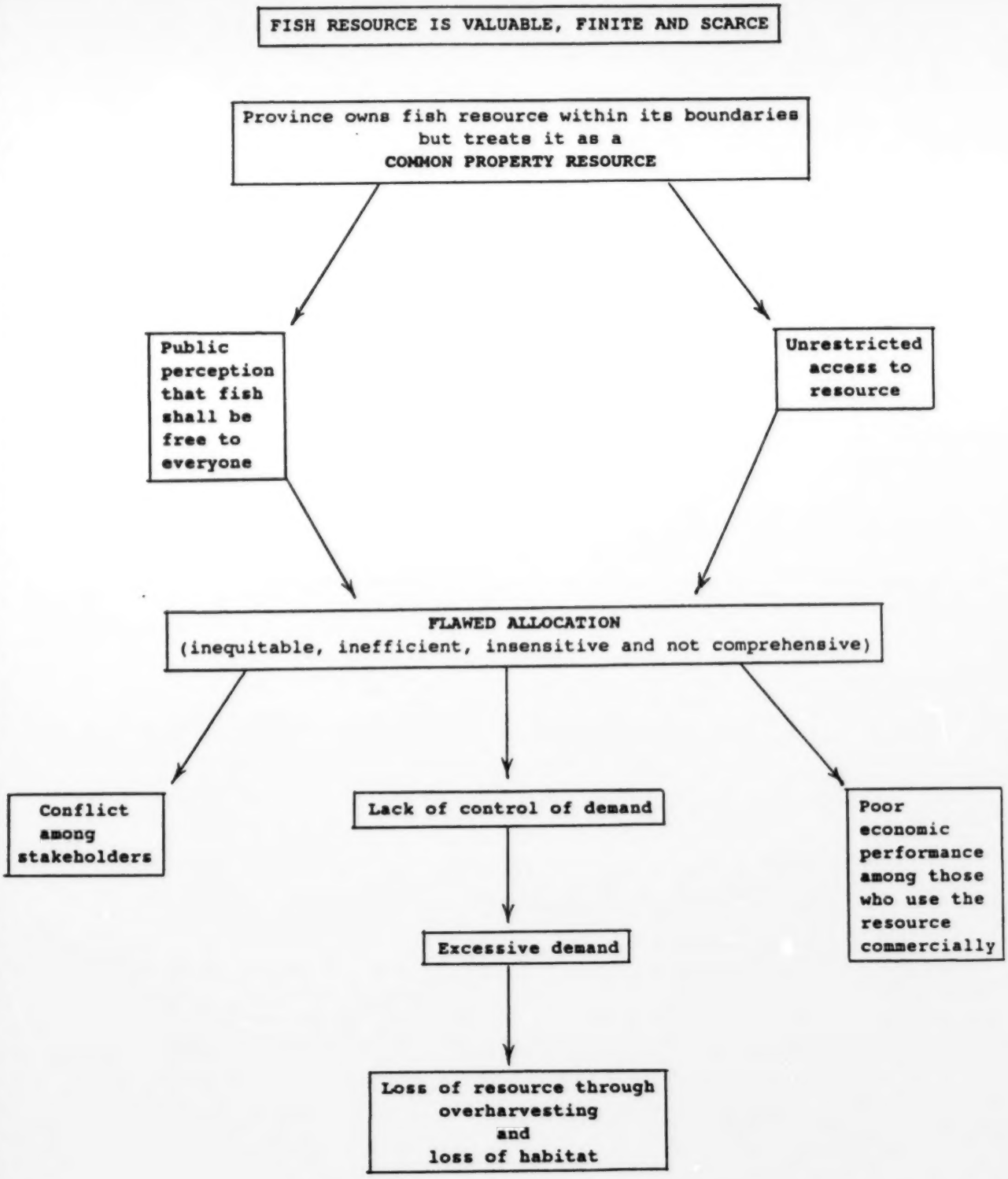
FISH RESOURCE IS VALUABLE, FINITE AND SCARCE
Province owns fish resource within its boundaries but treats it as a COMMON PROPERTY RESOURCE
Public perception that fish shall be free to everyone
Unrestricted access to resource
FLAWED ALLOCATION
(inequitable, inefficient, insensitive and not comprehensive)
Conflict among stakeholders
Lack of control of demand
Poor economic performance among those who use the resource commercially
Excessive demand
Loss of resource through overharvesting and loss of habitat

Figure 2. Issues affecting Saskatchewan's fisheries for the 1990s.

piecemeal fashion and no one is satisfied with the fish they receive.

- These problems stem from the province treating the fish resources within its boundaries as **common property** (please see Appendix A for additional explanation).

  - This led to the adoption of a **multiple use** policy which means that fish in most Saskatchewan lakes may be harvested by different groups of fishermen. This has resulted in expectations that no lake would be fished by only one group.

  - Saskatchewan is one of the last jurisdictions in North America to use this policy.

  - The policy has shortcomings: it may have been acceptable when there were fewer fishermen and access to most lakes was difficult, but the large numbers of fishermen and easy access to virtually all lakes in the province have resulted in excessive demand and harvests of fish.

- Stakeholders with differing sets of values utilize the same resources and disagree on how harvests should be shared.

  - This problem is complex because it involves reconciling the different uses of the resources, which have tangible and intangible values.

  - Reconciling these is difficult because few mechanisms are available for performing this task. Moreover the values themselves are changing rapidly at a time when society is undergoing great changes.

- The rapid growth of recreational fishing in Saskatchewan, with its social, cultural and commercial values, have put enormous pressures on the fish resources and displaced many other users. Adequate alternatives for safeguarding fishermen excluded from the resource do not exist and fisheries continue to be used for conflicting social and economic purposes.

- Inadequate opportunities for meaningful public involvement at all stages of the fisheries management process.

- Although the public and stakeholders have been increasingly involved in some activities associated with fisheries management, such as fish enhancement, they have not been effectively involved in the conservation, management and allocation of fish resources throughout the province.

- Insufficient knowledge about the resources and those who use them prevent timely management action.

- Poor public knowledge about the resources and their constraints have led to excessive demands and conflicts.

- Inconsistent decision-making process has contributed to conflicts about resource sharing.

- Current legislative mechanisms are time-consuming and involved.

LOSS OF FISH AND FISH HABITAT

Demand for fish in Saskatchewan - and elsewhere in the world - is greater than supply. This demand stems from the way the public perceives the resources and from the virtually unrestricted access to them (Figure 2). These originated with ideals about the use of fish and their habitats which

emerged in North America as a reaction to the exclusive fishing and hunting rights held by many European landowners and aristocracies. The ideals included notions that fish and their habitats are resources held or owned in common by all citizens, that all citizens have access to them, and that no royalties or rents will be paid for their use. Although these allow citizens to harvest fish, they do not protect the resources from overexploitation and depletion because resources provided free are used to excess. As a result, they force fishermen to fight for their real or perceived shares to the detriment of the resource and society.

CAUSES

- Loss of fish through overharvesting as a result of increased numbers of fishermen, overlimits and use of illegal fishing gear.

    - Unrestricted access as a consequence of the multiple use policy has resulted in overfishing.

    - The province treats its fish resources as common property and has not effectively resolved the resulting problems.

- Loss of fish habitat through incompatible land use practices by industry, agriculture and other sectors.

    - Global warming may also cause lakes and streams to recede.

- Contaminants in fish lower their value and inhibit their use.

- Insufficient data on the amounts of fish resources available, amounts allocated to the various user groups, amounts harvested, and on the status of populations being harvested. This is especially critical in northern Saskatchewan.

- Fisheries management and enforcement activities have not always been effective and timely.

POOR ECONOMIC PERFORMANCE OF THE FISHERIES

Those who use the resources commercially have low and erratic incomes and are concerned about their security of tenure at lakes where they or their clients fish. In addition, costs of managing the resources exceed revenues received from fishermen and the fisheries.

CAUSES

- Flawed allocation of harvests among different user groups has occurred as a result of the virtually unrestricted access to the resources and by the public's perception that fish shall be free to everyone (Figure 2).

- The common property nature of the fish resources attracts excessive numbers of commercial fishermen/lodge operators. Each attempts to maximize his/her earnings, and because the profits are only shared among the participants, and not with the owners of the resource, they attract even more individuals and encourage them to expand their operations until the cost of their capital and labor rises, and/or their harvests fall. As a result, financial returns in excess of the costs of fishing are ultimately eliminated and, because all operations are affected, the fisheries are left in depressed states. This is often described as the "tragedy of the commons" in the fishery.

- The true economic value of the fish resources is unknown and not well understood. The different uses for fish and their tangible and intangible values complicate the problem.

A PROPOSED PLAN FOR SASKATCHEWAN'S FISHERIES IN THE 1990s

GOALS

The goal is to sustain the fish resources and to use them to contribute to the social and economic welfare of Saskatchewan citizens. Today this is being referred to as **sustainable development** (please see Appendix B for additional information). The goal has three components (Figure 3):

1. maintain sustainable supplies of fish, enhance them whenever possible, and maintain and restore their habitats;

2. reconcile the social, cultural, recreational and economic values of fish harvests on an individual lake basis; and,

3. provide opportunities for improving the economic performance of the fisheries.

POLICIES

The goals can be attained by implementing three principal policies which address the issues (Figure 3).

CONSERVE AND RESTORE THE FISH RESOURCES

Fish, which are the basis for the fisheries, are finite, renewable, valuable and limited in abundance. The primary reasons for the loss of resources are overharvesting and habitat loss. Therefore fish populations must be conserved, protected and when advantageous, enhanced. This means the amount of harvesting must be carefully regulated and controlled. Proper conservation ensures that fish populations support their fisheries while meeting their reproductive requirements without man's assistance. Habitats must also be protected and improved where necessary. Sufficient monitoring

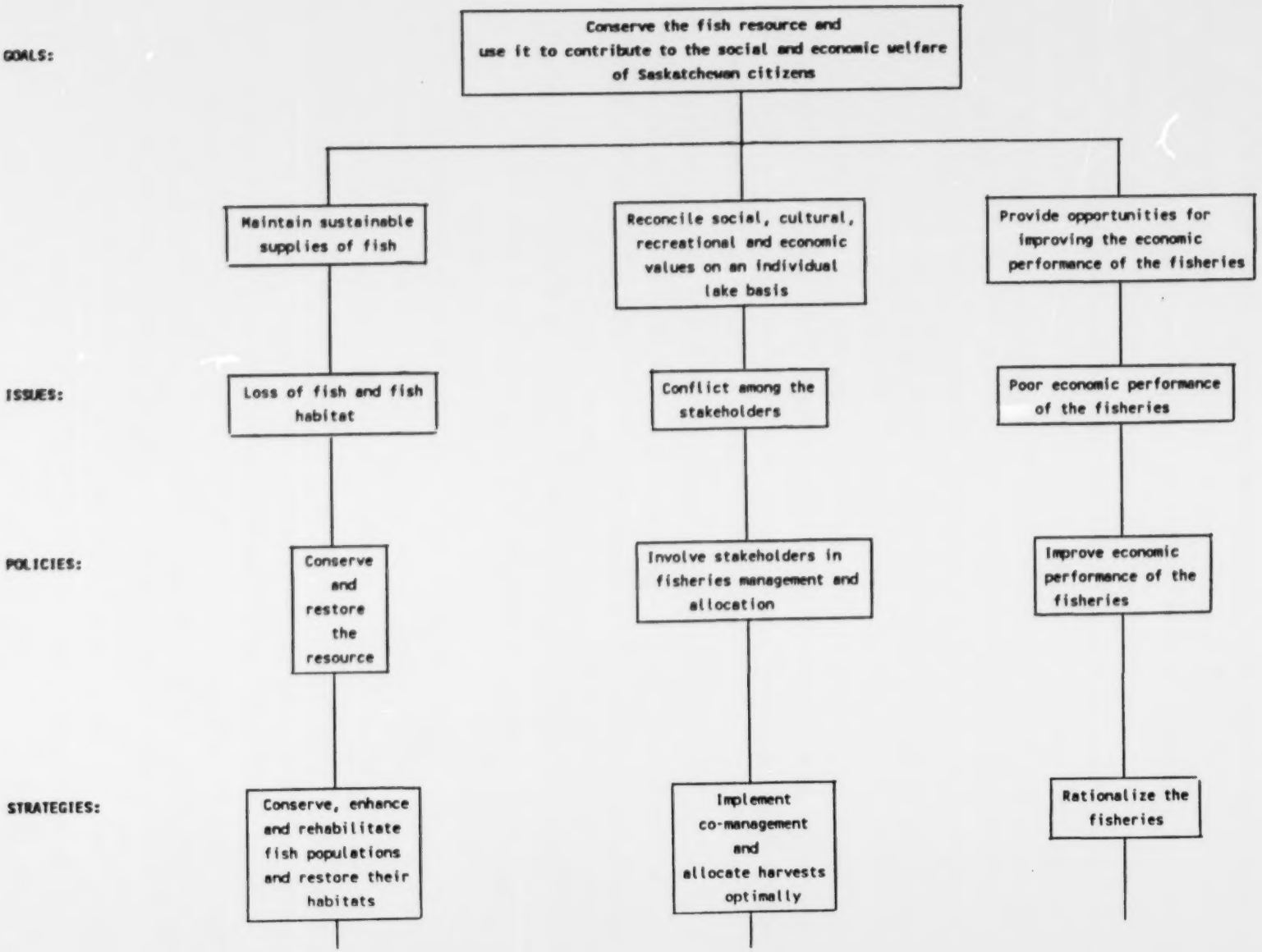
GOALS:
Conserve the fish resource and use it to contribute to the social and economic welfare of Saskatchewan citizens
Maintain sustainable supplies of fish
Reconcile social, cultural, recreational and economic values on an individual lake basis
Provide opportunities for improving the economic performance of the fisheries
ISSUES:
Loss of fish and fish habitat
Conflict among the stakeholders
Poor economic performance of the fisheries
POLICIES:
Conserve and restore the resource
Involve stakeholders in fisheries management and allocation
Improve economic performance of the fisheries
STRATEGIES:
Conserve, enhance and rehabilitate fish populations and restore their habitats
Implement co-management and allocate harvests optimally
Rationalize the fisheries

Figure 3. Proposed goals, issues and strategies for Saskatchewan's fisheries for the 1990s.

and data are required to ensure these activities are being carried out effectively.

INVOLVE STAKEHOLDERS IN FISHERIES MANAGEMENT AND ALLOCATION

Allocations that do not reflect stakeholder values are a major source of conflict among fishermen. Conflicts can be resolved through a co-operative process which offers fishermen an active role in management and allocation decisions, as well as provides a forum for resolving their differences. Involving stakeholders in fisheries management activities is a relatively new strategy known as **co-management** or **co-operative management** (please see Appendix C for additional explanation). Co-management involves the co-operative action by two or more parties with some degree of shared authority and responsibility for the resources. It has the ability to provide innovative solutions to complex problems at a time when uncertainty and change are the rule rather than the exception.

By involving stakeholders in the decision-making process, the policy attempts to provide support and opportunities to people as well as improve the skills they need in managing renewable resources.

By involving stakeholders in the decision-making process, the policy also attempts to reconcile the differing values and uses of the resources and, at the same time, allocate harvests to those who can use them in the most beneficial ways. This is known as determining **best use**.

Stakeholders will determine what constitutes best use by consensus on a lake by lake basis because what is best for one lake may not be best for another. They must derive criteria that are socially, culturally, recreationally and economically acceptable to meet the needs of their individual situations.

IMPROVE ECONOMIC PERFORMANCE OF THE FISHERIES

Few commercial net fishermen and outfitters receive earnings in excess of reasonable returns for their capital and labor; returns are, in fact, low and unstable. Rationalization of the size of these fisheries to the resources available should improve their economic returns. Commercial users also need assurance that their incomes and opportunities will not be diminished as a consequence of the increased demand for the resource. Careful attention to both costs and benefits is required if the fisheries are to be a source of value to the province rather than a burden. Management and enforcement costs currently exceed revenues. Revenue to government should be increased as a consequence of rationalization and should be based on rights to fish and the value of the resources.

Involving stakeholders in the process of rationalization enables them to priorize economic growth and diversification of their fisheries. This will have a beneficial effect on small communities because they will gain increased control over the utilization of resources on which they depend.

FISHERIES MANAGEMENT PRINCIPLES

The goals and policies of fisheries management in Saskatchewan are based on seven principles.

RETAIN PROVINCIAL RESPONSIBILITIES FOR FISHERIES MANAGEMENT

Although the strategic plan recommends devolving allocation responsibilities to stakeholders, the Department will retain its constitutional and legal rights and responsibilties for managing fish resources in the province. This means that it will retain control over the biological components of resource management and ensure stakeholder decisions are consistent with provincial fisheries management goals and policies. This provides an opportunity for the Department to assume a positive, leading role in fisheries management and allocation, and at the same time, work co-operatively with the stakeholders.

MAINTAIN HEALTHY ECOSYSTEMS AND SPECIES DIVERSITY

Healthy aquatic ecosystems are indispensable for the stability and security of human communities because they sustain processes vital to human life. The amount of fish that can be produced by, and harvested from, aquatic ecosystems is limited. Since human activities can diminish this productive capability, healthy fish communities can be ensured by managing both human activities and aquatic ecosystems.

MANAGE FISH POPULATIONS ON A SUSTAINABLE BASIS

Fish are the basis for the fisheries and must be conserved and protected. The supply of fish and aquatic resources in Saskatchewan is finite and cannot be significantly increased. Renewable resources must be harvested on the basis of their supplies, not on the basis of demand for them. The fish resources are held in trust by the Crown in right of Saskatchewan for its citizens. This means fishery managers must ensure they are maintained in perpetuity by allocating stocks for maintenance and replenishment before allocating fish for harvest. This principle, and the one above, will ensure the benefits of healthy ecosystems and sustained fish populations will continue to accrue to Saskatchewan stakeholders.

MAINTAIN DIVERSITY OF OPPORTUNITY

Greater social and economic benefits will accrue to Saskatchewan citizens if a variety of fisheries are supported throughout the province. Although it is true that several fisheries may not be viable on a single lake, they may be viable on a group of lakes. Thus on some lakes, or in some areas, it is possible that recreational fishing may provide the most benefits, whereas on other lakes, or in other areas, commercial fishing may provide these. It is also possible that on some lakes, or in some areas, both fisheries together may provide the most benefits. The principle affirms the necessity of maintaining as many options as possible to maximize economic and social benefits.

Maintenance of diversity of opportunity should not be confused with the multiple use policy. The latter led to excessive demand because it resulted in expectations that no lake should be fished by a single group of fishermen. Diversity of opportunity means utilizing the fishery, or fisheries, that will provide the most benefits.

MAINTAIN PUBLIC ACCESS TO FISH RESOURCES

Traditionally the public have enjoyed access to fish resources as well as to parks, wildlife, timber and resource lands. Terms of access have changed over the years, and will continue to change as demands for finite resources increase. However the access principle itself will be maintained.

PROVIDE FISH TO TREATY INDIANS AS REQUIRED BY THE RESOURCES TRANSFER AGREEMENT, 1930

These rights, which were included in an agreement between the governments of Canada and Saskatchewan, must be recognized and appropriate allocations made. This allocation must be made before all other allocations are made. A potential for conflict exists between this right, because of its acknowledged primacy, and the need to conserve the resources. Education and negotiation will be required to ensure that the resource base is maintained in perpetuity for all citizens.

ACQUIRE DATA ON THE STATUS OF THE FISH RESOURCES AND THE FISHERIES

Sound fisheries management requires information about fish populations, their extent, condition, dynamics and habitats, as well as about the economic and social aspects of the fisheries, and those who use them.

Each fishery is affected by different factors. A complex system for acquiring and analyzing data is required because thousands of lakes and streams are being fished. Funding limitations will place more obligations on stakeholders to provide data on their use of fish, and on the value of their use, to support more effective management.

STRATEGIES AND TACTICS

Three principal strategies are proposed for the 1990s (Figure 3): conservation; co-management; and rationalization. Co-management is placed in a central position because it is linked to conservation and rationalization. Each strategy consists of several tactics (Figure 4).

All tactics are not applicable everywhere in Saskatchewan. Because of the unequal distribution of lakes and people in the province, some tactics are more suitable for 'southern' lakes (i.e., most lakes in the Southern Management Zone and some in the Central Zone) and others are for 'northern' lakes (i.e., some lakes in the Central Zone and all lakes in the Northern Zone).

Several tactics are identified for each strategy. The tactics, and how and where they may be applied, are briefly described.

CONSERVE, ENHANCE AND REHABILITATE FISH POPULATIONS AND RESTORE THEIR HABITATS

Proposed tactics include:

1. **Regulate harvests to conserve stocks of fish by:**

   a) **establishing total allowable catches (TACs) for each lake and species;**

   The TAC is the total catch or harvest permitted for a species of fish in a lake.

   TACs are determined by departmental biologists, usually on an annual basis, and are usually set before the fishing seasons open. The process relates current harvests to sustainable supplies of fish and adjusts future harvests to allow the populations to maintain themselves.

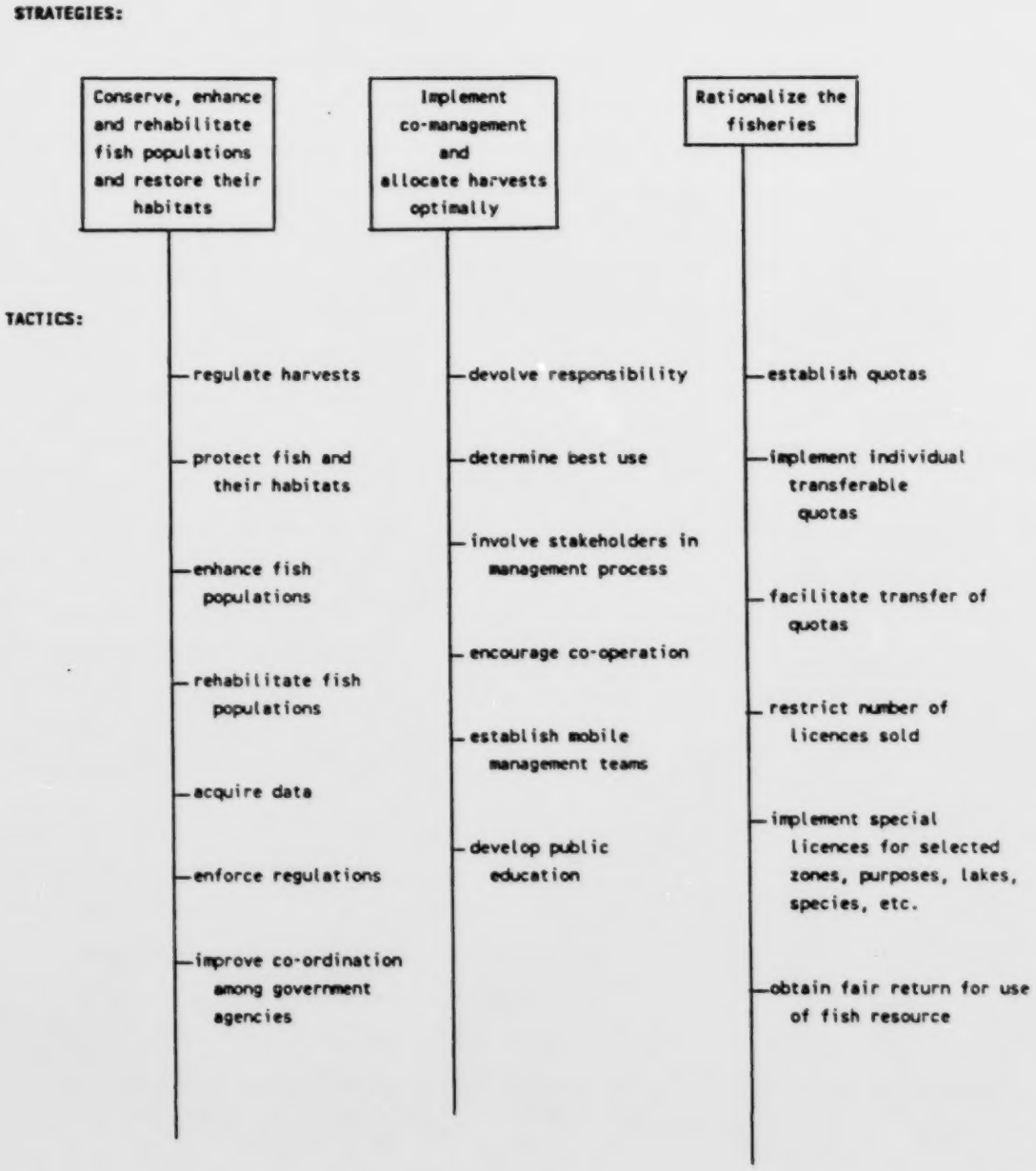
STRATEGIES:
Conserve, enhance and rehabilitate fish populations and restore their habitats
Implement co-management and allocate harvests optimally
Rationalize the fisheries
TACTICS:
regulate harvests
protect fish and their habitats
enhance fish populations
rehabilitate fish populations
acquire data
enforce regulations
improve co-ordination among government agencies
devolve responsibility
determine best use
involve stakeholders in management process
encourage co-operation
establish mobile management teams
develop public education
establish quotas
implement individual transferable quotas
facilitate transfer of quotas
restrict number of licences sold
implement special licences for selected zones, purposes, lakes, species, etc.
obtain fair return for use of fish resource

Figure 4. Proposed strategies and tactics for Saskatchewan's fisheries for the 1990s.

TACs have been set for many of the lakes that are being fished in the province, and over time, and with the assistance of stakeholders, will be extended to all lakes fished in Saskatchewan.

b) **controlling fishing by regulating catches and limiting effort, by imposing closed areas and seasons, and by restricting the type and amount of gear that may be used and size of fish that may be caught; and,**

These tactics, which control the amount of fishing, form the basis of the current fishing regulations used throughout the province. They will continue to be used where situations warrant.

c) **restricting entry to selected fisheries by controlling the numbers of licences that may be sold.**

This tactic would only be used on the advice of stakeholders where harvests are excessive because there are too many fishermen. Initially it would be used experimentally at a few lakes until it had been evaluated.

The process will involve issuing a limited number of special licences for a specific lake. These licences may also be accompanied by one or more tags which must be attached to fish that are caught and retained.

2. **Protect fish and their habitats and restore those which have been degraded by man's activities.**

This work is being done throughout the province either by departmental staff, stakeholders, proponents of industrial activities, or some combination of the above. The nature of the work varies according to the restoration required. These activities will continue into the future.

3. **Enhance fish populations to supplement natural reproduction where possible.**

4. **Rehabilitate fish populations to compensate for the inadequacies of regulation and protection where possible.**

Tactics #3 and #4 are mainly confined to 'southern' lakes because of their small size. These programs depend on the fish culture station at Fort Qu'Appelle and this facility will continue to provide a wide variety of fish in the 1990s and beyond.

These activities are examples of participatory co-management that currently exist in southern Saskatchewan. Most of the enhancement projects have been co-operative, that is, an organization or agency other than the province acts as the proponent and contributes money and/or volunteer labor. Local chapters of the Saskatchewan Wildlife Federation have been frequent co-operators. Projects to date include rearing ponds, habitat improvement, trout ponds, aeration systems, introduction of new species, experimental hatcheries and fishways.

The need for this type of participatory co-management will not diminish and may well increase in future.

5. **Acquire sufficient data about fish, fishing, habitats and fishermen to support management activities by:**

   a) **setting priorities for the acquisition of information based on resource management needs;**

   b) **improving techniques for the acquisition and application of knowledge to protect and rehabilitate fish communities and habitat;**

c) **improving the understanding of the impacts of management actions and environmental changes on fish populations;**

d) **developing an understanding of the socio-economics of fishing;**

e) **deriving a true economic value for fish irrespective of the fisheries; and,**

f) **strengthening efforts to integrate information so that it is useful in decision making.**

All of these tactics are currently employed in Saskatchewan to a greater or lesser degree. Staff reductions and re-assignments, and the lack of a comprehensive strategy for evaluating the status of fish populations have resulted in a failure in recent years to collect all of the data required to properly manage the province's fish populations.

Implementation of a fisheries allocation strategy will result in a greater demand for data as well as a greater interest by stakeholders in the process of data collection and analysis. Given the current restrictions in funding, it is unlikely that the province will be able to provide the staff required.

Because TACs and harvest allocations must be based on sound data, stakeholders may ask to oversee, and perhaps even participate in the collection and analysis of data. This form of co-management will be welcomed because the data on which allocations are made will be subject to intense scrutiny. To avoid controversy about allocations based on them, the data must be as complete and as unbiassed as possible. Stakeholder participation will ensure the data meet these criteria.

6. **Enforce fisheries regulations firmly and effectively to ensure fish and their habitats are conserved and protected.**

   This tactic is currently operational throughout the entire province and will continue into the future.

7. **Improve co-ordination among government agencies sharing responsibility for managing aquatic ecosystems by:**

   a) **developing government policy and legislation to clarify agency roles and responsibilities;**

   b) **developing government policy and legislation to ensure fisheries input into decisions affectging aquatic ecosystems;**

   c) **strengthening formal mechanisms for consultation among government agencies to improve co-ordination of resource management; and,**

   d) **expanding co-operative programs to increase effectiveness and to ensure a comprehensive approach to ecosystem management.**

   These tactics are currently being implemented and will continue into the future.

IMPLEMENT CO-MANAGEMENT WITH THE STAKEHOLDERS AND ALLOCATE HARVESTS OPTIMALLY

Proposed tactics include:

1. **Devolve responsibility for allocating fish harvests to local stakeholders but retain responsibility for determining the amount of resource available at each lake within the Department.**

   Allocation is a two-step process. The first is determining the amount of fish available for harvest at each lake and the second is assigning this

harvest to the eligible user. Currently both functions remain within the Department. The strategic plan suggests the Department retain the first function and that the stakeholders assume responsibilities for the second.

2. **Foster co-management by encouraging all stakeholders to participate in the decision-making process which determines the best uses for fish harvests at lakes in which they have interests.**

Stakeholder involvement in fisheries management is consultative, advisory and participatory. This process is already well under way in Saskatchewan and it is anticipated that it will gain momentum in the 1990s.

Consultation includes communication and discussion which accompany public policy development in a democracy. It is part of the feedback and control mechanisms through which government keeps its policies and programs responsive to public needs and wants. In the 1980s consultation took the form of public reviews of a series of discussion papers on fisheries matters as well as meetings with a variety of user groups to discuss specific issues or receive feedback on policies and programs.

At the advisory level, input from stakeholders tends to be through representatives who sit on official or semi-official bodies which review new policies and programs. In the 1980s these included the provincial **Fish Advisory Committee** as well as lake management committees at Lac la Ronge, Lac la Plonge, and Dore Lake.

Participation is a form or partnership in which decision making and action is shared between government and stakeholders. In fisheries management, stakeholder participation means taking an active role in some activity, project or function, and assuming both authority and

responsibility for it. Stakeholders must address the concerns of all parties and reconcile these into forms of action acceptable to all.

Examples of participatory co-management in the 1980s include the fish enhancement program described above, as well as several commercial fishermens' co-operatives. The latter have made decisions of socio-economic significance within their fisheries including allocation of quotas, eligibility, performance criteria, and seasons and logistics.

3. **Involve local stakeholders in the management process by:**

   a) **encouraging them to develop local committees responsible for determining the best use of fish resources at each lake and for allocating harvests among eligible users;**

      Local management committees, which comprise representatives of all stakeholders, are vital to the success of participatory activities in fisheries management. Members must consider all points of view about the uses of the resource, status of habitats, regulations, economic and social concerns, data needs, etc., and reconcile these into decisions acceptable to all. The committees, which may be formal or informal, are useful forums for resolving differences and working out acceptable alternatives and actions.

   b) **encouraging them to participate in management decisions affecting lakes in which they have interests;**

      These decisions will differ from lake to lake. In general, decisions about 'southern' lakes will tend to focus on habitat restoration, enhancement, and control of angling. Decisions about 'northern' lakes will tend to focus on controlling all types of fishing, determining best use, and allocating quotas.

Examples of these activities, which began in Saskatchewan in the 1980s, have been described above. Thus it is expected that fish enhancement programs would continue in lakes in the southern half of the province, and that local lake management committees and commercial fishermens' co-operatives would continue in the northern half.

c) encouraging them to assist in the collection, analysis and interpretation of data; and,

The large number of lakes fished each year in Saskatchewan precludes the collection of comprehensive data from each of them by departmental staff. Stakeholder assistance in providing these data and in analyzing and interpreting these data will not only be welcomed but will benefit allocation and management activities.

d) providing them with data and information about their lakes and fisheries, as well as about the values and benefits of healthy aquatic ecosystems.

Stakeholders cannot know too much about the environment, fish and fisheries in waterbodies in which they have interests. In fact, the more they know and understand these complex matters, the more likely they will make the correct decisions about them.

4. Encourage opportunities to work co-operatively with non-government organizations.

Although government retains the power to overrule decisions that are not in the best interests of the environment, fish, or stakeholders, government is not the only agency with knowledge about aquatic resources, ability or funds to do work. Stakeholders are encouraged to seek advice and assistance of qualified individuals or agencies which can provide

assistance in environmental or fisheries matters or in reconciling different points of view.

5. **Establish a mobile management team to assist regional managers and stakeholders in the implementation of local lake management and allocation committees.**

A mobile management team is proposed to assist fisheries managers and stakeholders in their lake management committees particularly in the Central and Northern Management Zones where the issues are complex and conflicting. The principal functions of the team would be to listen to problems, to test and develop innovative solutions, to negotiate and assist in the process of reconciliation, to teach and communicate, and to assist managers and stakeholders alike to become self-sufficient.

The guiding philosophies would be to involve the stakeholders in all aspects of fisheries management, to encourage them to work with the regional managers and take whatever initiatives are required to resolve their problems, to encourage them to be innovative in their thinking, and to constantly experiment. The last item means supporting failures and learning how to do better.

6. **Develop and encourage public education and involvement programs based on the ecosystem approach to managing fisheries on a sustainable basis.**

Participation in a co-operative approach to fisheries management will require knowledgeable and sophisticated stakeholders. They will acquire this through actual "hands on" experience acquired as they perform the work associated with fisheries management. They will also learn from programs developed for children and adults. The latter will require the services of a specialist whose duties would be to develop these programs and the curricula and work with educational authorities to have them adopted by the school system.

RATIONALIZE THE FISHERIES

Proposed tactics include:

1. **Establish quotas for each lake and species which ensure sufficient fish are allocated for maintenance of the resource.**

   This tactic requires the establishment of three priorities. The first must be the allocation of fish for resource maintainance. The fish resources are held in trust by the Crown in right of Saskatchewan for its citizens. This means fisheries managers must ensure it is maintained in perpetuity by allocating stocks for maintenance and rehabilitation before allocating fish for harvest. The second is providing fish to Treaty Indians for food under the terms of the Resources Transfer Agreement. These rights must be recognized and appropriate allocations made. The third is allocating the remaining surplus production, if any, among all other users. These include subsistence fishermen, anglers, commercial net fishermen and outfitters.

2. **Establish quotas for each lake, fishery and species on the basis of current harvests.**

   Quotas are portions or shares of TACs given or allocated to one or more fishermen. They are derived from the TACs, which are the total catches, or harvests, permitted for each species of fish in a lake.

   Quotas are usually assigned initially on the basis of current harvests. This means that if one fishery takes, say, 30% of the total harvest of a species, then this fishery will be assigned a quota which is 30% of the TAC for that species.

   Quotas may be assigned to an entire fishery, such as a recreational fishery, or they may be assigned to individual fishermen within a fishery, such as to individual commercial net fishermen at a lake. Under

an individual quota system, all or part of the TAC is divided among individual fishermen on a percentage basis determined from their past participation. The quota for each fisherman is determined by multiplying his proportion by the quota for the fishery.

3. **Consult stakeholders and where they desire:**

   a) **establish property rights for the commercial users of the resource with individual transferable marketable quotas based on previous participation in the commercial net and outfitting fisheries;**

      Quotas are a means of allocating property rights. Individual transferable quotas (ITQs) are being utilized in many places in Canada and elsewhere in the world. They are a means of allocating to one or more individuals a transferable or tradable right to harvest a specific quantity of fish. The purpose is to achieve efficiency in harvesting by allowing those whose costs are least or whose capacity is greatest to obtain additional rights from others.

   b) **facilitate the transfer of these rights by sale or rent among the stakeholders;**

      The key feature of ITQs is their transferability which enables them to be subdivided or combined in any manner. This means that those who have them can augment them with more rights, divide them into rights with fractional entitlements, or dispose of them completely by gift, sale or rent.

   c) **allow the Department to hold the quotas for the subsistence and recreational fisheries and augment them by purchasing more from the commercial users of the resource or relinquish them by selling them to the commercial users of the resources;**

Recreational fisheries will also require quotas for each species harvested in some lakes. These quotas could be held by the Department in trust for anglers. If the demand were sufficient at lakes with mixed fisheries, the Department could increase the recreational quotas for a species by purchasing them from commercial users. On the other hand, if the anglers were not using all of their quotas, the Department could sell the unused portions to commercial users.

d) **restrict the number of licences for each lake and fishery on the basis of quota availability as required for conservation; and,**

Fish resources are finite and limited in production. Sustainable development requires that harvests be based on the supplies of fish in lakes, and not on the basis of demand for them. Thus it may be necessary to limit harvests, and thereby, the numbers of licences issued for certain species at some heavily fished lakes. These limitations must be determined on the basis of the available quotas and should be developed on the basis of discussions with, and requests from, lake management committees.

e) **implement special licences for selected zones, purposes, lakes, species, etc., for purposes of conservation.**

Special licences may be required to limit harvests of certain species in selected lakes, areas, etc., because fisheries management is based on maintaining sustainable development. These would be implemented on the basis of discussions with, and requests from, lake management committees.

4. **Obtain a fair return for the use of the fish resources and cover the costs of management and administration.**

The fish resources of Saskatchewan are renewable, finite and scarce. They are, as a result, valuable and are a source of revenue to the province but the revenue from the sale of fishing licences does not cover the costs of regulating and managing provincial fisheries. The shortfalls are currently made up from general revenues but should be borne by those who use the resource and benefit from it.

IMPLEMENTATION

The proposed plan is centered around three principal strategies: conservation, co-management and rationalization. The conservation strategy and many of its tactics are in place and functioning.

Co-management and rationalization are new. The need for them does not exist at all lakes in Saskatchewan and, as a result, these processes need not be implemented everywhere at once. Instead implementation would occur on a lake by lake basis and will begin either as a result of consultations with, or requests from, stakeholders.

Initially, co-management and rationalization should be attempted experimentally at lakes where there are few stakeholders and simple situations. These small projects will provide opportunities for everyone concerned to develop and refine the necessary skills and techniques and to make these processes work. Larger and more complex situations would be attempted incrementally over time. It is expected that these activities will proceed rapidly as familiarization with, and demand for, them grows.

Fisheries management plans, which reflect the broad needs, opportunities, and priorities to be addressed, as well as constraints presented by local geography, hydrology and population distribution, will be developed for each region in consultation with stakeholders. The ultimate goal is to develop individual lake and stream management plans with the help of interested

stakeholders. These will be implemented through co-management wherever possible and desirable.

PROGRAM ACTIONS

The strategic plan will be implemented through the existing program delivery system of Saskatchewan Parks and Renewable Resources (SPRR). This system comprises eight regions: La Ronge, Meadow Lake, Prince Albert, Hudson Bay, Saskatoon, Swift Current, Regina and Melville. Issues will be identified in each region, alternative courses of action proposed and evaluated, management plans prepared, and appropriate actions taken through locally-based processes of consultation and co-management.

Some actions are described as examples of activities which have been done, and which may continue to be done in future. They are presented on the basis of fisheries management zones because problems and issues within a zone tend to be similar.

SOUTHERN MANAGEMENT ZONE

This area includes the Swift Current, Saskatoon, Regina and Melville Regions, as well as the southern portions of the Meadow Lake, Prince Albert and Hudson Bay Regions. Most of the people in Saskatchewan live in this area and most of the fishing occurs here. Waterbodies in this zone are influenced by the amount of snow and rain they receive. Their numbers are limited and and many are affected by man's activities.

The small number of waterbodies dictates that program actions be directed to existing streams and reservoirs. Habitat protection and rehabilitation, intensive management and enhancement are important activities.

Habitat protection and rehabilitation. This is a major concern in the Southern Zone because of the limited number of waters and the impact of man's activities on them. Dams, reservoirs, irrigation, and lake and stream

shoreline alterations have positive and negative impacts on fish habitat. All habitat must be protected, and degrated habitat must be restored.

Stream enhancement. This is a relatively new initiative of the Fish Enhancement Program and will continue as a priority activity in the 1990s. Stream enhancement projects make use of local features and provide angling opportunities with low construction and maintenance costs. Co-operative projects are popular with local users, and several have won conservation awards.

Intensive fisheries management. Stocking reservoirs provides angling opportunities at reasonable cost. Reservoirs are used for multiple purposes, and stocking fish for angling is compatible with most of these. SPRR co-operates with municipalities and wildlife groups in the development of these projects.

The Southern Zone is also an area in which opportunities exist for the development of urban or "doorstep" angling, and for improvement of access for physically handicapped people, senior citizens and children.

CENTRAL MANAGEMENT ZONE

This area includes the Meadow Lake, Prince Albert, Hudson Bay and La Ronge Regions. It is a transition between the prairie Southern and forested Northern Zones. It has more waterbodies than the Southern Zone but fewer than the Northern. Most are natural and occur in attractive settings. Although few people live here the lakes support subsistence, recreational, outfitting and commercial net fishing and provide about half the total provincial harvest of fish.

Because of the number and variety of users, large harvests and finite supply, the principal program actions will be to rationalize the fisheries and manage them on the basis of sustainability. A range of other program actions will be implemented, as required, based on local problems and priorities.

Conservation. A variety of conservation measures will be implemented at individual lakes or groups of lakes. Because of the number and size of lakes in this zone, they must be managed on the basis of sustainability. Some require enhancement but this must be done selectively because the existing hatchery cannot service all needs in this zone.

Harvest quotas. Quotas must be established for each lake, fishery and species on the basis of current harvests and total allowable catches.

Catch and release angling. This program will educate users and highlight conservation, and at the same time increase the diversity of available angling opportunities by preserving selected fish stocks in a lightly exploited state.

Special angling limits and area closures. These measures will be taken to mitigate the overharvest or potential overharvest of game fish.

Separate species quotas for the commercial net fishery. These quotas have been implemented for all heavily fished waters, and will be applied whenever new quotas are established. Species management will remain a cornerstone of this fishery.

Rationalization. A new approach to allocation which involves determining the best use of the resource through co-management is central to the strategy for the 1990s.

Lake management committees. Fisheries management and allocation decision making by committees representing all stakeholders at a lake will be a major initiative in the Central Zone for the 1990s. This is an expansion and formalization of an existing initiative. Delegation of responsibility for allocating harvests among eligible stakeholders will be a feature of this program.

Lake management agreements. These agreements will provide for reciprocal actions between SPRR and users to facilitate mutual management interests on a waterbody. These will be pursued with outfitters, commercial net fishermen, anglers and subsistence fishermen.

Individual transferable quotas (ITQs). ITQs will enable stakeholders to shift to an agreed best use of the fisheries at lakes through economic means. Commercial users will be able to better chart their own futures, and make decisions regarding the size and types of operation while ensuring the resources are harvested at sustainable levels. This is known as "sustainable development".

Fish enhancement. A wide variety of projects under the Fish Enhancement Program will be implemented in the Central Zone. Lake aeration, lake and stream habitat improvement and trout pond development are some popular projects which will continue to provide new and diversified angling opportunities in the 1990s.

Habitat improvement. Actions will be taken to protect and enhance existing habitat to preserve naturally reproducing fish populations.

NORTHERN MANAGEMENT ZONE

This zone includes the Meadow Lake and La Ronge Regions. More than 70% of the lakes in the province occur here. The principal fisheries are commercial, subsistence and outfitting, and they are managed on the basis of sustainability. As in the Central Management Zone, because of the number and variety of users, large harvests and finite supply, the principal program actions will be to sustain the resource and rationalize the fisheries.

Conservation. The conservation program actions to be implemented in the Northern Managment Zone are similar to those proposed for the Central Zone. The number and size of lakes, and their remoteness, makes it imperative that the fisheries be managed for sustainability. Maintenance of fishing quality

is also important, hence trophy fish protection and catch and release programs will receive increased attention.

Harvest quotas, catch and release angling, special angling limits and area enclosures, and ***separate species quotas for the commercial net fishery.*** These program actions are similar to those described for the Central Zone.

High quality angling. The High Quality Angling program, which applies reduced limits to specific waterbodies to maintain existing angling quality, has been well received by outfitters, and will be expanded in this zone in the 1990s.

Rationalization. Rationalization and allocation of harvests through co-management with stakeholders will be important program actions in this zone.

Lake management committees, lake management agreements, and ***individual transferable quotas (ITQs).*** These program actions are similar to those described for the Central Zone.

Fish enhancement and **habitat protection and improvement.** Actions will be taken to protect and enhance, where feasible, existing habitat to preserve naturally reproducing fish populations. Some fish enhancement activities will also be undertaken to bolster fish populations in small waterbodies. Maintenance of fish populations in large waterbodies is impractical in terms of the cost and numbers of fish required. Moreover these populations are managed better on the basis of sustainability.

ENTIRE PROVINCE

In addition to the above programs which apply to specific areas, programs will be developed which provide a variety of ***educational opportunities*** for Saskatchewan residents of all ages. School curriculum material and general informational material and workshops will be used to increase public awareness of fish habitat and aquatic ecosystems, the importance of sustainable

development in fisheries management, and the opportunities and benefits of consultation and co-management.

Increased attention will be given to other species, such as burbot, through programs such as, "Don't waste the taste", to both sustain and develop fisheries based upon them.

The single most important feature of the plan for the 1990s is the need for the increased involvement of stakeholders in the fisheries management decision-making process. Government simply cannot address all the problems and resolve all the issues confronting the fisheries and, as a result, it must rely on stakeholders for assistance. The term co-management reflects the co-operative nature of the process wherein each group of stakeholders must contribute something of value to the process in order to benefit from it. Thus it is truly a two-way street in which government and stakeholders participate equally for the sustainable development of Saskatchewan's fisheries.

CONCLUSION

The foregoing represents a general framework and, even though it lacks detail, it should serve as a catalyst to bring stakeholders and resource managers together to discuss issues, goals, policies, strategies and tactics. The next step is a regional planning process in which stakeholders and resource managers meet to discuss more localized concerns. Regional strategic plans, which would identify issues, goals, policies, strategies and tactics for each region of the province, should result from these discussions.

SUGGESTED READING

The attention of the reader is directed to some books and articles containing information on the fish and fisheries of Saskatchewan.

1. Rising to the Challenge. A New Policy for Canada's Freshwater Fisheries. P. H. Pearse. Canadian Wildlife Federation. 1988. 180 p.

2. Fisheries Allocation: Strategies for Managing Saskatchewan's Fisheries in the 1990's and Beyond. Saskatchewan Parks, Recreation and Culture, Fisheries Branch. 1989. 169 p.

3. Consultation and co-management: stakeholder involvement in the management of Saskatchewan fisheries. Saskatchewan Parks and Renewable Resources, Fisheries Branch. 1990.

4. Saskatchewan Fisheries Policy - Action Plan. Saskatchewan Parks and Renewable Resources. 1983. 12 p.

5. Proposed Goals and Strategies for Fisheries Management in the 1980's. Saskatchewan Tourism and Renewable Resources and Northern Saskatchewan. 1981. 79 p.

6. 1985 Survey of Sport Fishing in Saskatchewan. Saskatchewan Parks, Recreation and Culture, Fisheries Branch. 1988. 172 p.

7. Involvement of People of Indian Ancestry in Saskatchewan's Fisheries. Saskatchewan Parks and Renewable Resources. Manuscript Report. 224 p.

8. An Economic Survey of Saskatchewan's Outfitting Industry. Canada Fisheries and Oceans, Winnipeg. 61 p.

9. Estimated Sustainable Yields and Supplies of Fish in Saskatchewan's Lakes. Saskatchewan Parks and Renewable Resources. Manuscript Report. 1985. 55 p.

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APPENDIX A

FISH, COMMON PROPERTY RESOURCES AND THE TRAGEDY OF THE COMMONS

The problem of overfishing which has occurred in Saskatchewan lakes and streams is attributed to the common property nature of the fish resources (Figure 2, page 15). Although the province has proprietary rights over fishing within its boundaries, Saskatchewan has allowed virtually unrestricted access to its fish resources by not exerting ownership. Harvest is based on the "rule of capture", that is, fish in a lake or stream are not assigned through property rights to any particular person. Each fisherman competes with all others for a share of the catch and has no right to any particular quantity until he/she has landed it. The resource is treated as common property until caught.

Access to the fish resources is, as a result, virtually unrestricted and this means that no fisherman has exclusive property rights to the fish resources. A fisherman cannot prevent others from using the resources, unless, of course, the waterbody is on his/her land. Conservation efforts by one fisherman are futile because he/she has no guarantee that others will do the same. Thus it is rational for a single fisherman to maximize his/her harvests by catching as much as possible. When all fishermen do this, harvests often become excessive especially when large numbers of fishermen are present. They become part of a system in which harvests increase without limit on finite populations that eventually collapse from overfishing. This is known as the "tragedy of the commons" in the fishery.

This situation is particularly evident in the recreational fishery because of the variable, unknown, and often very large number of anglers who may fish any given lake. The problem is not caused by a few anglers exceeding their daily limits but it is caused by the cumulative effect of the large harvests that result when a great many people fish.

The economic consequences are equally serious. As more commercial fishermen enter the commercial fishery and compete for larger shares of the harvest, the catch per fisherman falls, earnings decline, costs increase because fishermen invest in more gear or larger and better boats and, as a result, harvesting capacity increases. The fishery is often left in a depressed economic state when harvests decline.

These problems are caused by treating a finite resource as common property; the effects are excessive demand. Most of the current management activities are directed to dealing with the effects, not the cause. Thus they either attempt to increase the supply of fish or protect them through regulation. Few attempts have been made to reduce the numbers of fishermen. None has been completely successful because they fail to address the fundamental problem.

A lack of property rights in the fisheries suggests that some form of these might be vested in individual fishermen or enterprises. Quotas, which are portions or shares of the total allowable catches, are a form of allocating property rights in fisheries. They have been successfully applied in many fisheries throughout the world. They may be assigned to individual lakes, or to one or more fisheries at a lake, or to individual fishermen in these fisheries.

Individual quotas are advantageous for fishermen because they eliminate competition. A secure quota for each fisherman provides peace of mind and may help remove the adversarial approach to regulatory reform. Individual quotas are beneficial for commercial fishermen because they enable them to fish as cheaply as possible as well as at the time of year when prices are highest and quality is best. Reduced government involvement and increased stakeholder decision making are other attractive features of property rights in fisheries.

Not everyone agrees with the above. Individual quotas may promote economic efficiency but are they equitable? Critics state that such a system could result in unfair control of harvesting by selected groups of fishermen. Others state that fisheries which must be both equitable and efficient will be neither. Still others state that equity should be handled independently of resource allocation.

There is no consensus on these matters but there is agreement that change is needed. Many solutions are possible but no one of them is ideal for each and every lake in Saskatchewan. The best solutions will be developed by stakeholders through consensus on a lake by lake basis to suit individual situations.

APPENDIX B

SUSTAINABLE DEVELOPMENT

Sustainable development means developing the world's economy at a rate, and in a way, that is compatible with the planet's ability to renew itself. In other words, economic growth today should not be at the expense of economic growth tomorrow. Moreover renewable resources, such as fish, should be harvested on the basis of their sustainable supplies, not on the basis of demand for them.

People are an integral part of aquatic ecosystems as their activities can have important impacts on them. Fish are an indicator of the health of aquatic ecosystems because, like miners' canaries, their absence is often a sign of environmental or biological distress. Thus man's use of aquatic systems must be compatible with the ability of both the environment and fish to sustain healthy populations.

Fisheries managers have long managed fish populations on the basis of sustainability. Indeed fisheries management has been centered for more than 40 years around the concept of *maximum sustainable yield*. It is based on stability, that is, the ability of a fish population to absorb changes in the amount of fishing, or in its environment, and regain its equilibrium or balance. A decline in numbers of fish below the maximum carrying capacity of the environment would lead to an increase in the rate of growth of its population and a return to its maximum level. If the catch by man just matches the growth in the fish population then the size of the population will remain unchanged and the catch can be sustained indefinitely.

This concept is not used much today because it is based on undisturbed populations. These are increasingly rare as man's numbers and economic demands increase. Current environmental concerns are signals that the well being of the world is not adequately served by concentrating on the equilibria

of undisturbed populations. As a result, the concept has been replaced by *sustainable yield* which is the rate at which a fish population may be harvested so that it can support and maintain itself. Attempts to harvest at higher rates will reduce the population and, if continued, will lead to collapse.

The *sustainable supply* is the amount of fish that may be harvested annually and not adversely affect its population. This means that basing harvests on what is present in a waterbody will enable fish populations to renew and sustain themselves indefinitely.

All fishing activities affect sustainable development. Commercial and recreational fishing are often compared to see which is the most beneficial to a lake, community or even the province. These comparisons have at least three difficulties.

First, the comparisons are often done to show that one fishery is economically superior and should displace the other. Such comparisons are incorrect and overlook the fact that it is not always a case of one or the other but it is more likely that both fisheries together can provide more benefits than either one alone.

Second, there is the problem of measuring gains and losses. This is especially difficult because they are tangible and intangible, as well as economic and social.

Third, there is the problem of measuring the value of the angling activity itself. Neither the value of the fish caught nor the cost of the equipment and gear are correct measures. They tell nothing about the value of recreation. Moreover they may understate the value of fishing because most anglers see value in the activity and not just the catch. Solutions are being sought but have difficulty dealing with activities which are essentially non-market products.

In summary, sustainable development in Saskatchewan's fisheries contains three important concepts: maintain the health of the environment; base harvests on the size of the fish populations; and reconcile the different perspectives, choosing the best combination of fisheries for each lake individually. Failure to accept these means development will not be sustainable!

APPENDIX C

CO-MANAGEMENT

Fisheries management in Saskatchewan is increasingly complex. Biological, social, cultural, economic, environmental, fiscal and legal factors must be considered when management decisions are made. Public demand for programs and services is also increasing at a time when fiscal and human resources are decreasing. Under these circumstances the centralized bureaucratic structure is finding it difficult to manage a resource comprising more than 50,000 lakes, hundreds of thousands of fish populations, and one-quarter of a million fishermen.

This situation is also true for other North American jurisdictions. Examination of the strategies used in these places indicates that decentralization to stakeholder-based local management is becoming a preferred option. Stakeholders become involved in fisheries management activities through a variety of advisory and participatory roles. This is commonly called co-management.

Examples of co-management currently in Saskatchewan include: the Fish Advisory Committee; the Fish Enhancement Program; socio-economic decision making by commercial fishermens' co-ops; Lac la Ronge and Dore Lake allocation committees; and a variety of ad hoc and individual activities. Co-management in other jurisdictions includes a wide range of group structures and activities which cover all aspects of fisheries management.

Requirements for co-management include: a common interest in a specific issue; the ability of all parties to communicate effectively; a unifying focus on conservation; a willingness on the part of government to share power with stakeholders; and representation of all stakeholders in the process.

Co-management can produce a wide range of benefits. It can: give conservation top priority with conflicting users; build adaptive problem-solving groups based on the diversity of participants; maximize fiscal and human resources; develop stewardship; foster trust and communication among stakeholders; defuse conflict; determine the best use of each fishery; and facilitate self-regulation.

Constraints to co-management may include: relations among stakeholders may be initially adversarial; additional funding may be required; departmental staff skills may require upgrading; co-management activities can require significant commitments of time from staff and stakeholders; accurate and timely data must be available; and the decision-making process may be slow.

Factors critical to the implementation of co-management include: good communication; an incremental, opportunistic and experimental process; tolerance among participants for the process and for each other; and the requirement that errors and failures are supported to avoid the paralysis which comes with the fear of failure.

Current co-management activities in Saskatchewan will continue into the 1990s. New opportunities which may be pursued by stakeholders in the future include: collection of data; analysis of management options; use of experimental management agreements; implementation of individual transferable quotas; and involvement in public education.

In summary, fisheries management in Saskatchewan presently involves stakeholders in a wide range of activities. In the past these were done on an *ad hoc* basis. Adoption of co-management as an integral component of the strategies for the 1990s can provide the basis for flexible, adaptive fisheries management which is ecologically sound and locally optimized. It will also give the province a system capable of meeting the challenges of increased complexity, demand and uncertainty which the future will bring.